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ABSTRACT

The diffusion and adoption of new knowledge is an important outcome of education. This study used the results of two annual cross sectional surveys in a largely rural state, Nebraska, one of school administrators and one of students. The purpose of the survey was to identify how widespread Human Immunodeficiency Virus (HIV)/Acquired Immune Deficiency Syndrome (AIDS) education is and the degree to which students in grades 9-12 receive new information on HIV/AIDS and how this information affects their behavior. A total of 1,241 students were surveyed in 1989 and a total of 2,237 students were surveyed in 1990 using a different sample of schools. Principals in all Nebraska schools including grades 7-12 were surveyed by mail about the nature and extent of the HIV/AIDS education programs they offered. The results indicated: (1) an increased proportion of Nebraska schools offered some form of HIV/AIDS education at every grade level; (2) the proportion of young people who were aware of the added effort to help them learn about HIV/AIDS and who reported knowing where to go for additional information increased; (3) despite educational efforts, the percentage of students who answered incorrectly if a person can get HIV/AIDS infected by donating blood increased; (4) there was no evidence that sexual intercourse behaviors changed. These data show the value of carefully monitoring changes that are occurring as a result of educational responses to the HIV/AIDS epidemic. (ABL)

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THE SCHOOL'S RESPONSE TO THE HIV/AIDS EPIDEMIC: ONE STATE'S DATA

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THE SCHOOL'S RESPONSE TO THE HIV/AIDS EPIDEMIC: ONE STATE'S DATA

The diffusion and adoption of new knowledge is an important outcome of education. In public health terms the speed at which diffusion and adoption proceeds is critical to containing the spread of disease. This paper uses the results of two annual cross sectional surveys in a largely rural U.S. state, Nebraska, one of school administrators and one of students. The purpose of the survey was to identify 1) how widespread HIV/AIDS education is, and 2) the degree to which students in grades 9 through 12 receive new information on HIV/AIDS and how this information affects their behavior.

The Data

In 1989 Health Education Incorporated, a nonprofit corporation under contract to the Nebraska Department of Education, surveyed a sample of 1,241 Nebraska students in grades 9 through 12. Nebraska school systems are divided by the population of the (district) into six classes. Sampling was stratified by the class of school. In selected schools all students in a proportionate number of classrooms, depending upon the size of the school, were selected to complete an HIV/AIDS questionnaire, developed by the U.S. Centers for Disease Control.

Data were gathered by trained enumerators employed by Health Education Incorporated. No teachers or school officials were involved in data collection. Anonymity and confidentiality was assured. Collected surveys were sealed in envelopes in front of the students and taken from the school by the enumerators.

In 1990 this procedure was repeated with a different sample of schools and 2,237 students selected in the same manner. In 1990 the survey instrument used was the Youth Risk Behavior Survey developed by the US Centers for Disease Control which contained a number of the same questions asked the previous year, allowing useful comparisons.

In both years principals in all Nebraska schools including grades 7-12 were surveyed by mail about the nature and extent of the HIV/AIDS education programs they offered their students. The survey was developed by the U.S. Centers for Disease Control. Follow-ups continued until a 75% response rate was achieved in each of the two years.

In the year between these two surveys there was significant educational activity related to HIV/AIDS. A Nebraska Department of Education staff person worked full time encouraging schools to expand their HIV/AIDS education, holding workshops for teachers and principals and distributing education materials and curricula to all schools. The Nebraska Department of Health also carried out extensive public health education initiatives. The media highlighted HIV/AIDS in a variety of ways.

While the student data discussed in this paper are not necessarily from the same schools as those who supplied information on their educational programs, the two sets of data for the two time periods do give reasonably accurate assessments of the status of the schools' educational activities and the students' knowledge and practices. Given the care with which the data were gathered and the adequacy of the sampling frame there appears to be little reason why these data would not be representative of the state as a whole.

Results

These results suggest the nature and degree of the schools' response to the HIV/AIDS epidemic. They also suggest the nature and extent of student knowledge gains about HIV/AIDS. In addition, these results suggest two byproducts of the diffusion and adoption process; the spread of misinformation and the difficulty in countering erroneous information. Lastly, these results confirm the classic delay between knowledge gain and behavior change.

The possible spread of misinformation and the difficulty in countering erroneous information are only suggested by these data. However, even this suggestion illustrates the need for continuing evaluation and continuous monitoring of educational effect if specific public health education objectives are to be met.

Changes in the Schools

From the end of the 1988-89 school year to the end of the 1989-90 school year an increased proportion of schools provided some form of HIV/AIDS education at every grade level. The largest increase in the provision of HIV/AIDS education was at the lower grades.

Percent Schools/Grades HIV/AIDS Education

Grade	1988-89	1989-90
7	54.7%	63.7%
8	51.3%	57.9%
9	59.3%	61.1%
10	56.7%	61.7%
11	44.4%	45.0%
12	52.8%	53.4%

Similarly, the proportion of students receiving HIV/AIDS education increased at every grade level. (See table on following page.)

Percent Students Receiving HIV/AIDS Education

Grade	1988-89	1989-90
7	68.6%	76.2%
8	53.9%	62.8%
9	41.1%	52.8%
10	57.6%	61.7%
11	19.3%	32.1%
12	21.8%	36.6%

As the grade level increases fewer schools provided HIV/AIDS education. Also, as the grade level increases the proportion of students served by schools that did provide HIV/AIDS education decreased.

In addition to the increases in the number of schools offering HIV/AIDS education and the increases in the proportion of students served, there was an increase in the average number of class periods spent on HIV/AIDS instruction. The percentage increase in class time was greater in the lower grades, lesser in the higher grades.

Class Periods Devoted to HIV/AIDS Education
Last Year

Grade	1988-89	1989-90	% increase
7	3.8	5.8	52.6%
8	4.0	6.0	50.0%
9	4.2	5.9	40.5%
10	5.4	7.1	31.5%
11	3.9	4.4	12.8%
12	4.0	4.3	7.5%

Changes Among Students

Effective health education programs should provide evidence of effectiveness in three ways. Students will notice the increased educational effort. Students' knowledge of where to seek additional information will increase. Also, students will be encouraged to

talk about this increased knowledge and to seek out more information from other persons, preferably a parent or family member. For this latter change to occur parents or family members need also to become better informed. In the ideal situation this would be the result of a successful public health education program being conducted in parallel with the school health education program. Increased discussions would be a clear indication that information was diffusing through the community.

Have you ever been taught about HIV/AIDS in school?

	Males	Females
"Yes" 1989	49.9%	52.1%
"Yes" 1990	72.2%	81.5%

Do you know where to get information about HIV/AIDS?

	Males	Females
"Yes" 1989	47.1%	50.6%
"Yes" 1990	67.9%	63.6%

Have you ever talked about HIV/AIDS infection with a parent or other adult in your family?

	Males	Females
"Yes" 1989	38.6%	51.0%
"Yes" 1990	38.9%	51.5%

The proportion of young people who are aware of the added effort to help them learn about HIV/AIDS and who report knowing where to go for additional information, has increased. There is no evidence, however, that more of them are talking to their parents or other adults in their families about HIV/AIDS.

Increases in Knowledge

Unfortunately, few of the knowledge items in the 1989 survey were repeated in 1990. Two items that were repeated illustrate that knowledge gains are not always as simple as some believe. Increases in the percentage of correct responses means either fewer with incorrect answers or fewer who admitted they did not know the correct answer when first asked.

Can a person get HIV/AIDS infection by being bitten by a mosquito or other insect?

	Yes	No	Don't Know
1989	18.6%	53.5%	31.1%
1990	16.9%	63.1%	20.0%

The proportion answering this question correctly increased significantly between 1989 and 1990: 53.5% to 63.1%. However, the proportion answering incorrectly did not change appreciably: 18.6%-16.9%. The increase in the proportion of correct responses appeared to come from those who "didn't know" at the first survey. New knowledge, in other words, is diffusing through the community; in this case the school. Educational efforts however do not appear to have overcome, or to have corrected, the significant proportion of young people who are misinformed about mosquitoes and HIV/AIDS. Correcting misinformation may be much more difficult than providing information to those who don't know.

Can a person get HIV/AIDS infection by donating blood?

	Yes	No	Don't Know
1989	29.2%	60.0%	10.9%
1990	35.5%	58.3%	6.2%

This question on blood donation illustrates another phenomenon even more worrisome to health education planners. The proportion of correct answers decreased slightly but not significantly between 1989 and 1990; 60.0 to 58.3%. However, the proportion of incorrect answers increased significantly; 29.2% to 35.5%. Again the increase is accounted for by a decrease in the proportion of the sample that "don't know."

Why the increase in the wrong answer? At this point, conjecture suggests a few reasons. The risks associated with blood as a vector for HIV/AIDS may be misunderstood. Perhaps the discussion about body fluids and blood transfer of disease confused students. Are students confused about the difference between receiving blood and donating blood? Is there diffusion of incorrect or incomplete information?

Increases in incorrect information should not occur as a result of a planned educational effort. If they do occur they should be countered as soon as detected.

In this case, discussions about why and how blood donating affects HIV/AIDS risk may be enlightening. New questions to define this misunderstanding could then be incorporated into a longer survey to confirm its prevalence. Appropriate changes or additions could then be incorporated into teacher preparation programs, curricula and teaching practice.

Adopting Knowledge and Changing Behavior

The questions discussed above yielded data describing diffusion of knowledge. The diffusion and adoption of knowledge in health education is designed specifically to encourage behavior change. In public health emergencies the time delay between knowledge diffusion and acquisition and adoption of the encouraged behavior needs to be as short as possible. These next questions addresses whether behavior changes can be detected. One of several critical behaviors in the HIV/AIDS epidemic is sexual intercourse.

Have you ever had sexual intercourse?

	Yes
1989	56.3%
1990	54.3%

How old were you when you first had sexual intercourse?

	Never had sex	≤ 12 years	13-14 years	15-16 years	17+ years
1989	43.2%	8.9%	15.2%	25.7%	7.0%
1990	45.7%	7.5%	17.0%	25.9%	3.9%

There is no clear evidence that sexual intercourse behaviors have changed except for the suggestion of fewer students having their first sexual intercourse at age 17 or older. Increased educational efforts and possibly increased knowledge are not reflected in behavior change.

While this lack of behavior change may frustrate some, it is expected. The delay between knowledge and behavior is well documented. Considering that misinformation may be increasing in some areas of knowledge and that parents and students are not yet talking together about HIV/AIDS, it would be unrealistic to expect changes in sexual intercourse behavior.

Unfortunately, the two questionnaires did not include questions about other behaviors that might be easier to change. Increases in safe sex practices, condom use for example, may occur as a result of new knowledge before changes in intercourse and therefore might be a more sensitive marker of the diffusion process.

Conclusion

These data show the value of carefully monitoring changes that are occurring as a result of educational responses to the HIV/AIDS epidemic. As a result of significant efforts to increase student knowledge there is evidence that knowledge is increasing. At the same time there is also evidence that some misinformation is also increasing.

This analysis is based on the principles of the diffusion and adoption of new knowledge. Unfortunately, the two questionnaires were not based on the same principles. Accordingly, the analysis breaks down. While knowledge questions allowed for detailed analysis behavior questions common to both surveys were too limited in scope to assess how a range of behaviors were being affected. This is an unfortunate shortcoming considering the critical importance of behavior change to controlling the spread of HIV/AIDS.